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Two New Species of *Stenophragma* Skuse from Western Australia (Diptera, Mycetophilidae, Sciophilinae)

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ABSTRACT. *Stenophragma* Skuse was originally described for *S. meridianum* (Skuse), from Australia. Since then seventeen species have been added to the genus—from Brazil, Ecuador, Peru, Bolivia, Paraguay, Chile, Argentina, and Canada. We add two new species to the genus *Stenophragma*—*S. bickeli* n.sp. and *S. collessi* n.sp.—from Western Australia. An identification key for the Australian species of *Stenophragma* is provided. Comments are made about possible relationships among these new species and the remaining Australasian species of the genus.

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KEYWORDS: *Stenophragma*; Sciophilinae; Mycetophilidae; Australia; Taxonomy.

The current diversity of Mycetophilidae, a family known to be present already in the Jurassic, exceeds 4,100 described species distributed in approximately 180 extant genera (Evenhuis, 1994; Amorim & Silva, 2002; Pape *et al.,* 2011). The known diversity of the Australian Mycetophilidae is poor, with only 75 species, described mainly by F. A. A. Skuse, for the Australian continent, A. L. Tonnoir for Tasmania, and L. Matile for New Caledonia (Evenhuis, 2012); but the actual fauna is no doubt much richer (Yeates *et al*., 2009).

The family is certainly monophyletic (e.g., Rindal *et al*., 2009), but phylogenetic studies using morphological (Søli, 1997; Tozoni, 1998) and molecular data (Rindal *et al*., 2009) have demonstrated that Sciophilinae *s.l.* is paraphyletic in relation to the Mycetophilinae. This justifies the subfamilial rank given to taxa previously presented as tribes (Väisänen, 1984; Matile, 1989; Rindal *et al*., 2009). The Sciophilinae *s.s.* includes genera with medial and cubital forks complete, as well as genera with M_2 and/or M_4 weakly developed or missing, or with an unattached vein between the medial and cubital veins (Oliveira & Amorim, 2010).

As found in other ancient insect families with broad distribution, the Australian Mycetophilidae fauna does not compose a single clade, instead it exhibits a mixture of elements of different origins and a complex biogeographic history. *Stenophragma* Skuse is one of the genera that have species in both the Australian and Neotropical regions. *Stenophragma* is poorly known in terms of its biology. In the Neotropics, adults can be collected with Malaise traps in humid forests throughout the year, but most species show a peak of activity in the spring and autumn (Duret, 1976).

Skuse (1890) erected the genus *Stenophragma* from a species from Australia—*S. meridianum*, previously allocated in the genus *Homapsis* (Skuse, 1888; Blugledich, 1999). He also described the two other known Australian species: *S. hirtipennis* and *S. picticornis* (Skuse, 1890; see also

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Bugledich, 1999). In addition to these three species, fifteen others have been assigned to the genus: *S. paponorum* Matile, from New Caledonia (Matile, 1991); *S. longifurcata* Freeman, *S. ochracea* Freeman, *S. argentina* Duret, *S. naumanni* Duret, and *S. obscura* Duret, from Argentina (Freeman, 1951; Duret, 1976); *S. andina* Duret, from Ecuador (Duret, 1979); *S. fusca* Edwards, from Peru; *S. humeralis* Edwards, from Paraguay; *S. intermedia* Edwards, *S. morigenea* Edwards, and *S. nigricauda* Edwards, from Brazil; *S. pleuralis* Edwards, from Bolivia (Edwards, 1934, 1940); and *S. glabanum* (Johannsen) and *S. similis* (Johannsen), from northeastern USA and eastern Canada respectively (Johannsen, 1910; see also Zaitzev, 1982). However, some of the Neotropical species of *Stenophragma* appear to belong to a new genus (Christopher Borkent, pers. comm.).

In this paper, two new species of *Stenophragma* from Western Australia are described, increasing the known diversity of the genus to 20 species. An identification key for the Australian species of *Stenophragma* is provided.

Material and methods

The specimens examined in this paper belong to the Diptera collection of the Western Australia Museum (WAMA), and to the Australian Museum, Sydney (AMSA). Holotypes and paratypes are housed at the WAMA, AMSA, and at the Museu de Zoologia da Universidade de São Paulo (MZUSP), Brazil.

The wings and terminalia were detached; head, thorax, wing and terminalia were drawn after dissection. Soft parts were cleared in 10% KOH 40°C for 4–6 h, neutralized in acetic acid, dehydrated, and mounted on permanent slides with Euparal or retained in glycerin. Photographs were taken using a Canon EOS 7D with the software Camlift Controller 2.2 and were prepared using Helicon Focus 5.0 Pro software and Adobe Photoshop. Drawings were made using a camera lucida and redrawn using Adobe Illustrator 11.0. Morphological terminology follows Søli (1997), except for wing venation, which follows Amorim & Rindal (2007).

Abbreviations used are: *ae*, aedeagus; *anp*, anepisternum; *C*, costal vein; *ce*, cercus; *ce1*, first cercomere of female terminalia; *ce2*, second cercomere of female terminalia; *CuA*, basal part of anterior branch of cubital vein; *cxI*, fore coxa; *cxII*, mid coxa; *cxIII*, hind coxa; *gcap*, gonocoxal apodeme; *gcx*, gonocoxite; *gs*, gonostyle; *h*, humeral crossvein; *ktp*, katepisternum; *ltg*, laterotergite; M_1, M_2, and M_4, branches of medial vein; *mep*, mesepimeron; *mes*, metepisternum; *mtd*, mediotergite; *par*, parameres; *pem*, proepimeron; *pes*, proepisternum; *pnt*, pronotum; R_1, anterior branch of radius; R_5, posterior branch of radius; *r-m*, radial-medial crossvein; *Rs*, radial sector; *S*, sternite; *sc*, scutum; *Sc*, subcosta vein; *sc-r*, subcostal-radial crossvein; *sctl*, scutellum; and *T*, tergite.

Stenophragma Skuse, 1890

Homapsis Skuse, 1888: 1131, 1191 (preocc. Foerster, 1868). Type-species, *H. meridiana* Skuse (mon.).

Stenophragma Skuse, 1890: 612 (nom. nov. for *Homapsis* Skuse). Type-species, *Homapsis meridiana* Skuse (aut.).

Diagnosis (modified from Duret, 1976). Body and legs slender. Wing membrane usually with darker areas, covered with micro- and macrotrichia; macrotrichia widely distributed, sparsely on basal half, densely on apical half; Sc reaching C close to Rs; C ending a short distance after R_5; R_4 present or absent; first sector of CuA very long, twice the length of cubital fork; M_{1+2} extremely reduced; M_4 strong curved basally; M_4 and CuA complete and divergent. Anepisternum bare, laterotergite and mediotergite setose. Male gonostyle with two or three main branches, rows of long and short spines organized in different arrangements. Tergite nine more or less rectangular distally, with a clear waist close to apex, more or less membranous, densely covered by short, thin setulae on inner surface.

Stenophragma bickeli n.sp.

Figs. 1–3, 5–13

Diagnosis. Wing with light brown maculae on sc-r, on first section of Rs, and on CuA beyond insertion of M_4; R_4 absent. Gonostyle with dorsal, median, and ventral projections bearing combs of small spines and numerous longer spines; T9 straight at anterior margin, rounded distally.

Material examined. Holotype, ♂, AUSTRALIA, Western Australia, Pilbara region. Juna Downs Station, Great Northern Highway, c. 8 km S of Karijini Dr. toff., -22:41:36, 118:42:19, 12–17 Aug 2005, LTM sites, CVA Volunteers, PILB038/08M, [Malaise trap] (WAMA). Paratypes: 1♂, same data as holotype (WAMA); 7♂♂, same data as holotype (AMSA); 1♀, same data as holotype, except 15–19 May 2006, PILB038/12M (AMSA); 1♂, 1♀, same data as holotype, except 15–19 May 2006, PILB038/12M (WAMA); 2♂♂, same data as holotype, except Juna Downs Rd. to Packsaddle Bore, c. 5 km E of homestead, -22:52:31, 118:31:49, 15–19 May 2006, LTM sites, CVA Volunteers, PILB039/12M, [Malaise trap] (MZUSP).

Description. **Male** (Fig. 1). **Head**. Vertex dark brown, with scattered setulae. Two ocelli separated from the eye margin by less than their own diameter. Occiput dark brown. Eye setose. Scape and pedicel light brown, rounded, with small setulae; 14 light brown flagellomeres, almost twice as long as wide, with scattered setae, first flagellomere about 1.6 the length of second one. Frons dark brown, clypeus dark brown, covered with short setae; labella brown; first and second palpomeres dark brown, almost of same length; third to fifth light brown, apical ones increasingly longer, last one almost twice the length of penultimate. **Thorax** (Fig. 2). Scutum light brown, with four longitudinal dark brown bands, the lateral ones more diffuse than the central ones. Scutellum light brown. Pleural sclerites light brown. Pleural membrane brownish. Scutum moderately arched, covered with scattered small setae. Scutellum with many setulae, and six slight longer setae. Pronotum setose, with some stronger setae. Anepisternum and katepisternum more or less straight ventrally, bare. Mesepimeron reaching ventral margin of thorax, bare. Laterotergite slightly projected outwards, with 9–11 setae of different sizes, suture at contact with mediotergite incomplete dorsally. Mediotergite slightly curved in profile, ventral half with two longer setae laterally and smaller ones mesally. Haltere with whitish yellow pedicel and light brown knob, some few setae on pedicel, knob more densely setose. Coxae I and III whitish yellow, coxa II light brown, femora, tibiae and tarsi whitish yellow. First tarsomere more than twice the length of second one; tibiae and tarsi with erect darker short bristles along almost entire length, those on hind tibia more or less aligned dorsally

Figure 1. *Stenophragma bickeli* n.sp. habitus, lateral view, paratype. Scale 1 mm.

and laterally. Tibial spurs 1:2:2, about twice the length of tibial width at apex, internal spurs shorter. Tarsal claws with a large apical tooth and a smaller, more basal one. **Wing** (Fig. 3). Length 3.4 mm, width 1.3 mm. Membrane homogenously hyaline, except light brown maculation on sc-r, on first section of Rs, and on second section of CuA (beyond insertion of M_4); membrane densely covered with microtrichia on all cells, macrotrichia widely distributed, more sparsely on basal half, densely on distal half. Sc complete, reaching C just beyond base of Rs, well sclerotized, with some few setae. C ending before wing apex, extending for just a short distance beyond R_5. First sector of Rs nearly transverse, devoid of setae, less than half length of r-m. R_1 relatively long, reaching C on apical fourth of wing; R_4 absent; R_5 reaching C before wing apex, well sclerotized; r-m curved anteriorly, more or less oblique posteriorly, well sclerotized, setose. M_{1+2} extremely reduced; M_1 and M_2 running more or less parallel along most of their length; first sector of CuA very long, more than twice length of second sector of CuA; M_4 strongly curved basally; M_4 and CuA complete, divergent, well sclerotized. A_1 incomplete, absent on apical third, but well produced basally. All posterior veins with dorsal macrotrichia. **Abdomen**.

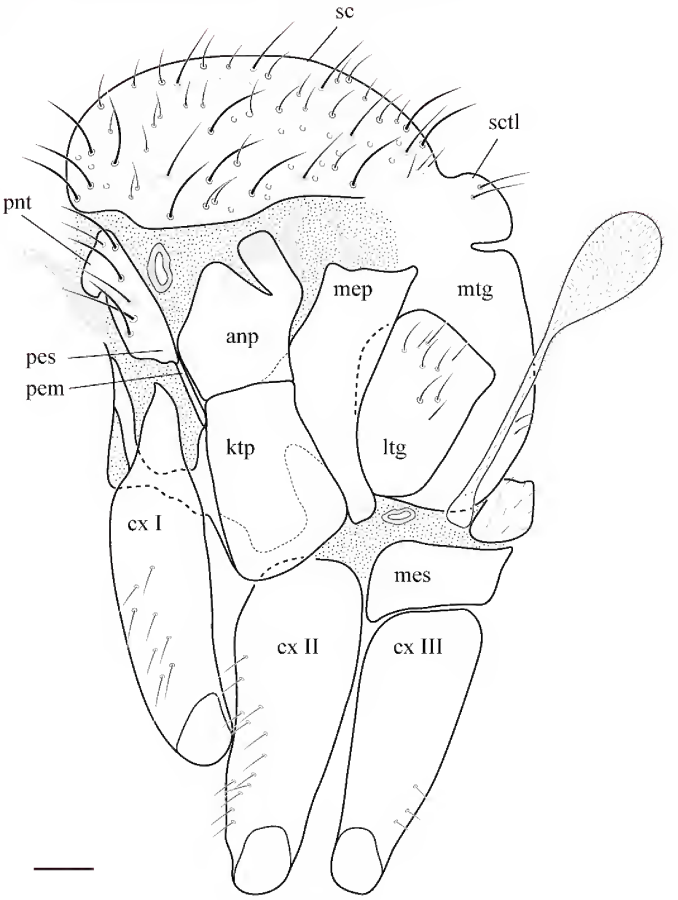
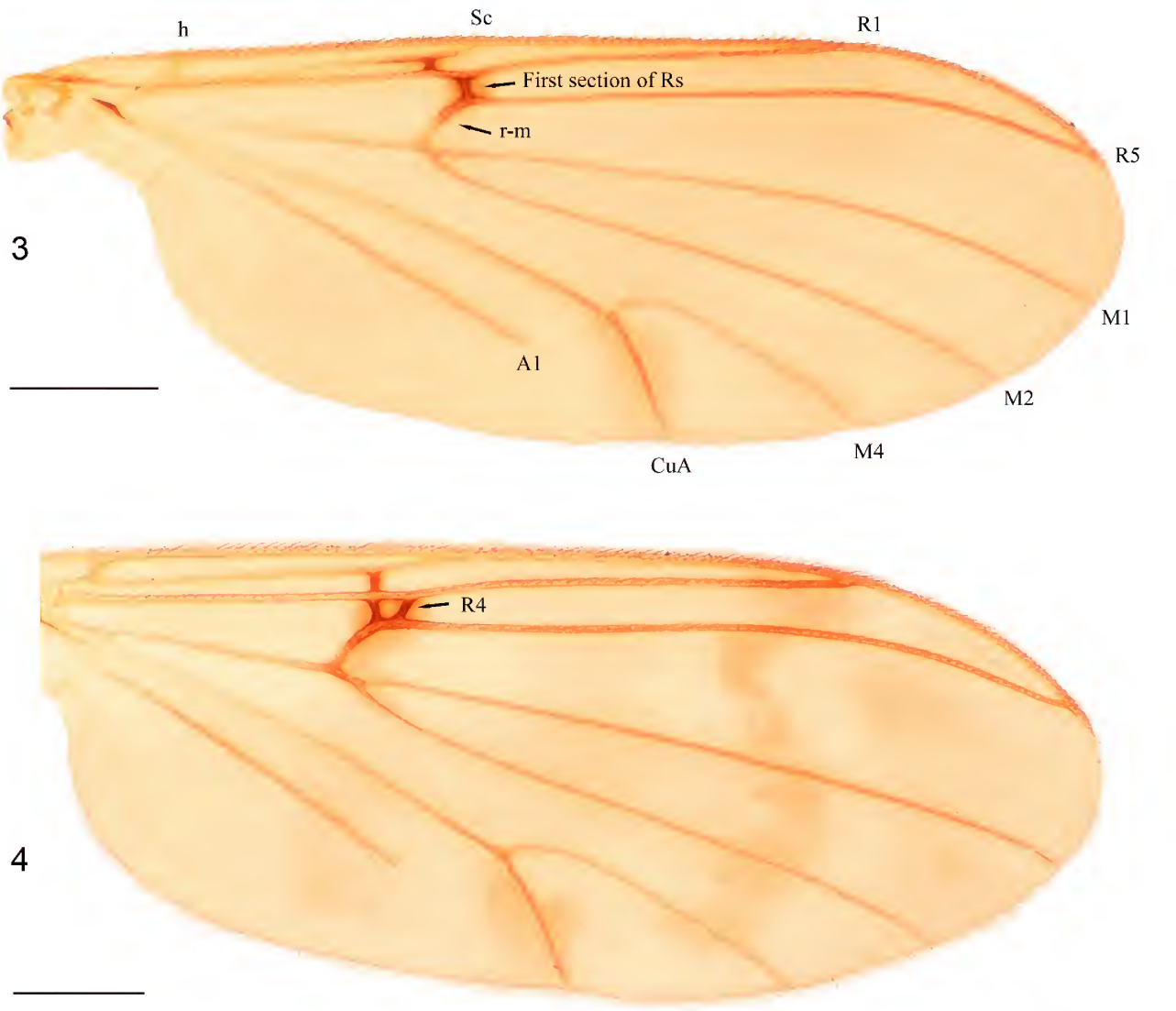


Figure 2. *Stenophragma bickeli* n.sp. thorax, lateral view, paratype. Scale 0.1 mm.



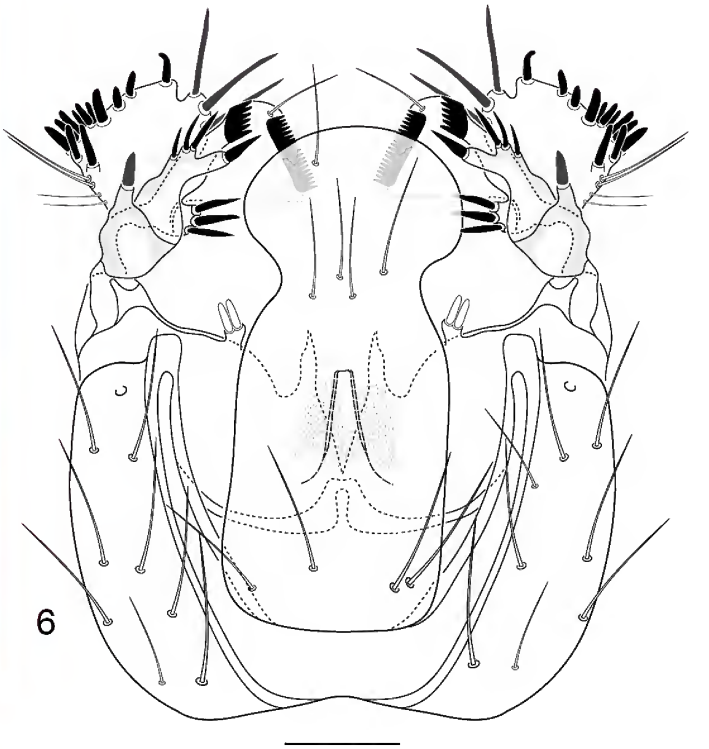
Figures 3–4. Wings of *Stenophragma*. *(3) S. bickeli* n.sp. paratype. *(4) S. collessi* n.sp. paratype. Scale 0.5 mm.

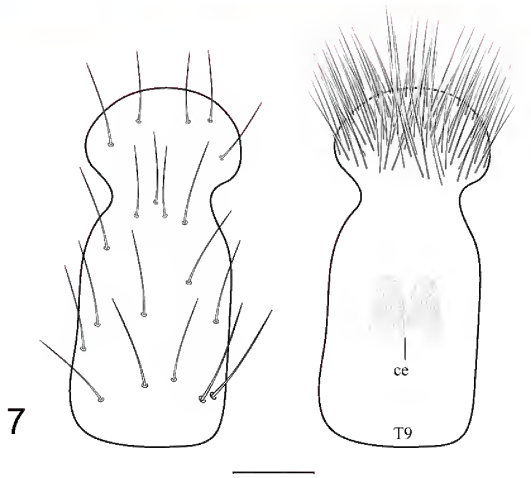
Abdomen light brown, setose, slender. T8 short and wide, S8 slender, longer than wide, rounded apically. Terminalia light brown, conspicuous, rounded. **Terminalia** (Figs. 5–11). Gonocoxites setose, fused to each other ventrally, with a pair of short, mesal extensions distally, pointed outwards at apex, besides a group of small aligned setulae; inner ventral surface with two white spines apically. Gonostyle complex, wide, with three main branches, dorsally, mesally, and ventrally; dorsal branch with one strong inner spine and four strong apical spines; median branch with one long setae apically and two rows of short spines and three strong basal spines; ventral branch wide, rounded, with short and strong apical spines and three long, very sclerotized setae on the inner margin. Aedeagus not seen; parameres membranous, straight at apex; gonocoxal apodeme well developed, sclerotized. T9 long, setose, apex as wide as base, straight at anterior margin, rounded distally, with typical waist close to apex; inner surface with many thin, long setae distally. Cercus weakly sclerotized, covered with many setulae.

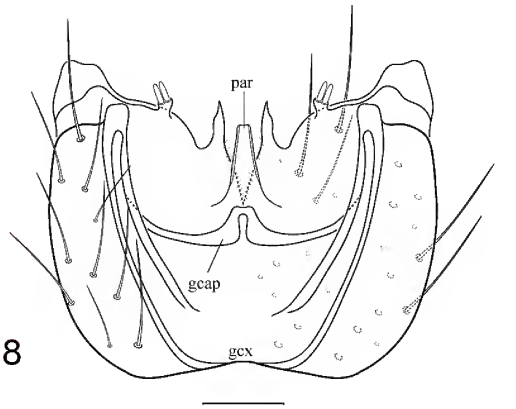
Female. As male, except as follows. Wing length, 3.8 mm, width, 1.5 mm. Antennal flagellomeres not as long as in males, near each other. Body general color lighter than in males. Abdomen yellowish. **Terminalia** (Figs. 12–13). Terminalia yellowish. Sternite 8 elongated, with a pair of posterior rounded gonapophyses, divided distally by a short medial incision, covered with fine, elongated setae on posterior margin; S9 (genital fork) not visible; S10 membranous, elongated, with microtrichia; T8 wide, short, as long as T9, covered with setae; T9 wide, short, covered with setae; T10 membranous, setose apically; Ce1 more than twice Ce2 length, covered with microtrichia and scattered setae; Ce2 ovoid, covered with microtrichia and few setulae.

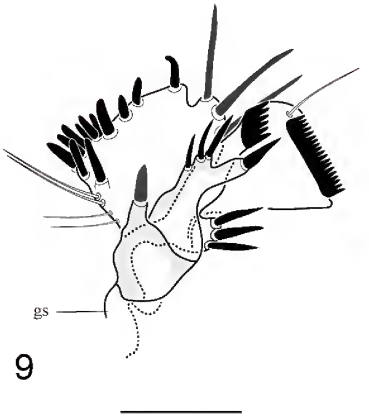
Etymology. The species name is masculine, named after the eminent dipterist Daniel J. Bickel, of the Australian Museum, Sydney. He has enormously improved the knowledge on the Dolichopodidae diversity in Australasian region and elsewhere in the world, and was an excellent advisor during the time spent working at the AMSA collection.

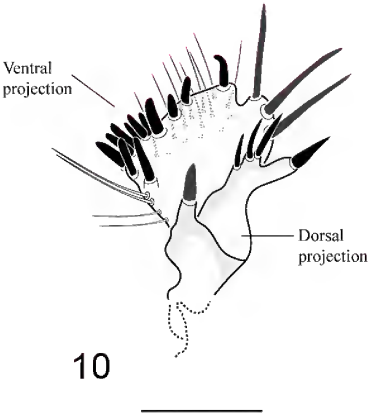
Comments. The absence of R_4 is shared by this species and *Stenophragma paponorum*, from New Caledonia. In this latter species (see Matile, 1991: fig. 12) the wings have three

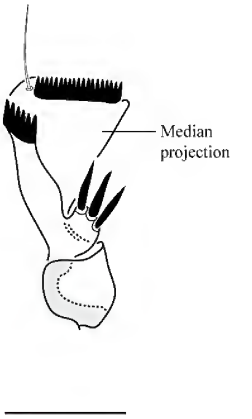




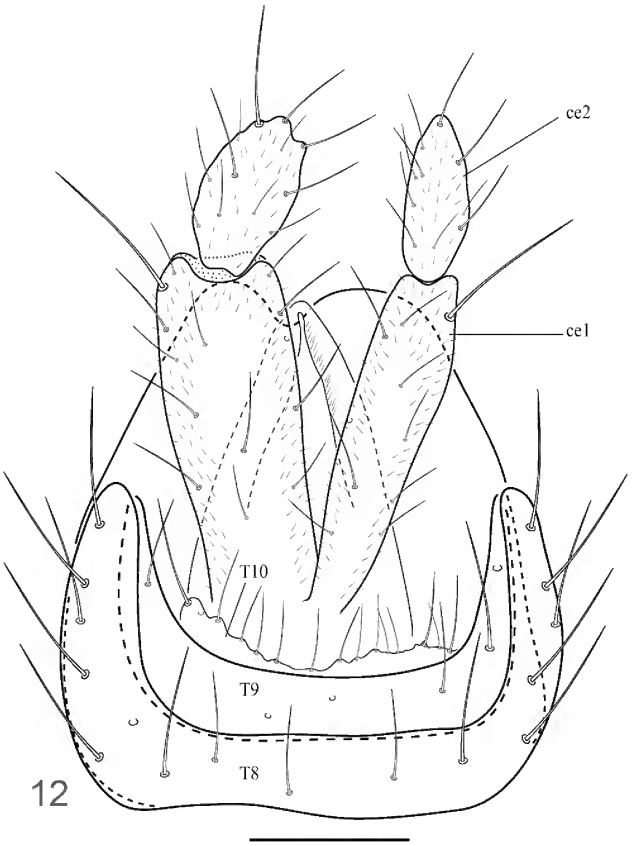


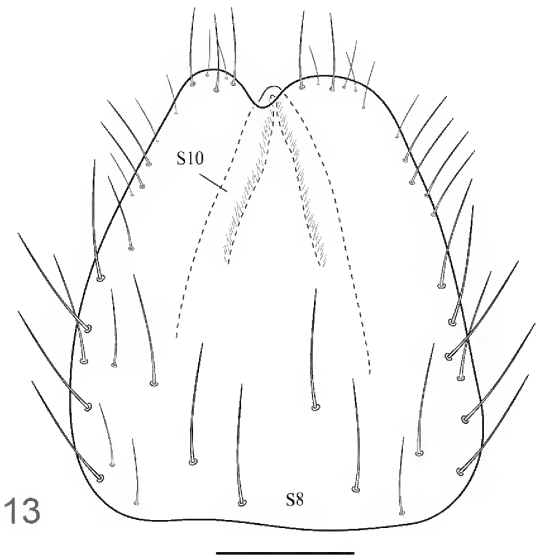






Figures 5–11. Male terminalia of *Stenophragma bickeli* n.sp. paratype. *(5–6)* Terminalia, dorsal view. *(7)* Detail of tergite 9 and cerci in dorsal view (left) and in ventral view (right). *(8)* Gonocoxite, gonocoxal apodeme, and parameres, dorsal view. *(9)* Gonostyle, dorsal view. *(10)* Detail of the ventral and dorsal projections of the gonostyle. *(11)* Detail of the median projection of the gonostyle. Scale 0.1 mm.





Figures 12–13. Female terminalia of *Stenophragma bickeli* n.sp. paratype. *(12)* Terminalia, dorsal view. *(13)* Detail of sternites 8 and 10, ventral view. Scales 0.1 mm.

vertical brown bands, one at the distal third, another from the apex of R_1 to the apex of M_4, a third between the mid of R_1 to the distal end of the first section of CuA. *S. paponorum* also shows inconspicuous brown maculae at the first section of Rs, R_4, r-m, and M_{1+2}. *S. paponorum* is known only by a female, so it is not possible at this stage to check if male features seen in the terminalia of *S. bickeli* n.sp. are shared with the New Caledonia species.

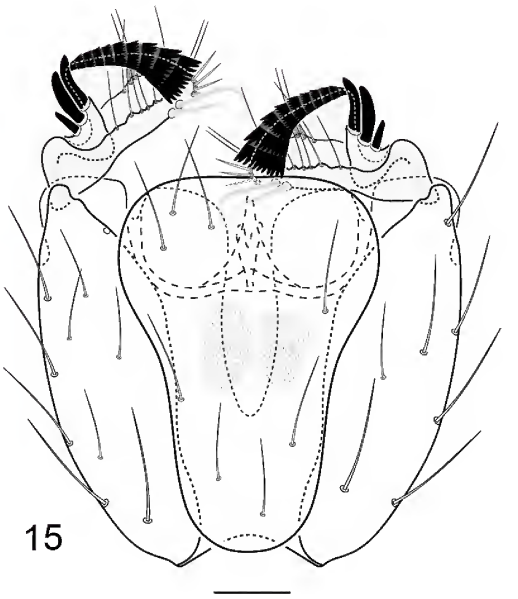
Stenophragma collessi n.sp.

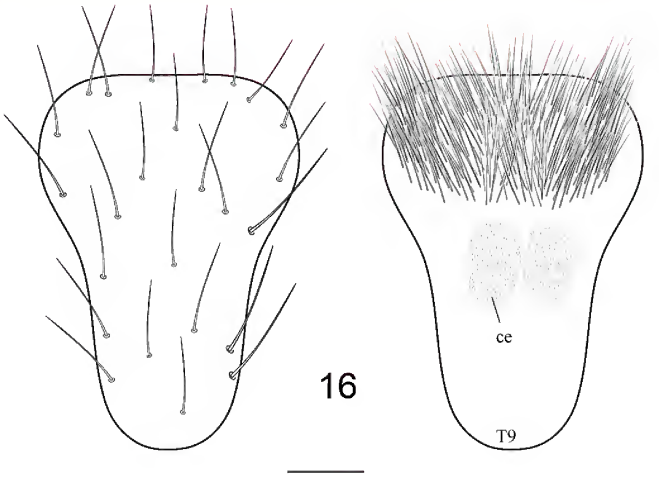
Figs. 4, 14–20

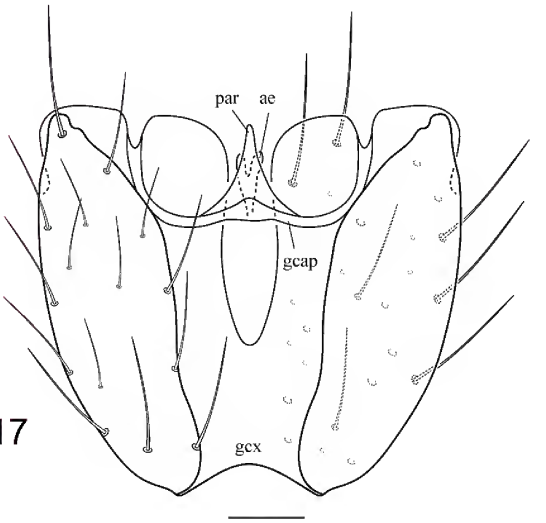
Diagnosis. Wing with light brown maculation on sc-r, on first section of Rs, R_4 and r-m, on first section of CuA, and a light brown sinuous band anteriorly on apical third of wing, from apex of R_1 to apex of M_4; R_4 present. Gonostyle long, with a ventral and a dorsal branches; T9 rounded at anterior margin, widening to apex. Female ce2 with three spines few sclerotized apically in the inner surface.

Material examined. Holotype, ♂, AUSTRALIA, Western Australia, 28km W. Yalgoo, 2 Sept. 1981, Malaise trap, G. A. Holloway coll. (AMSA K351926). Paratype: ♀, AUSTRALIA, Western Australia, 50km NW Yuna, 6 Sept. 1981, ex Malaise trap, G. A. Holloway coll. (AMSA K351927). **Additional material**. 1 individual, sex unknown, AUSTRALIA, Western Australia, 28km W. Yalgoo, 2 Sept. 1981, Malaise trap, G. A. Holloway coll. (AMSA).

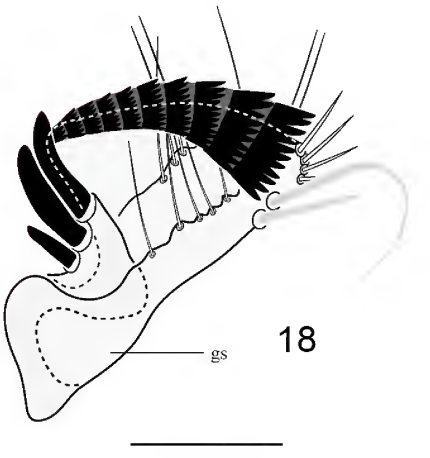
Description. **Male**. **Head**. Vertex brown, with scattered setulae. Two ocelli separated from the eye margin by less than their own diameter. Occiput brown. Eye setose. Scape and pedicel yellowish, rounded, with small setulae; first flagellomere light brownish on basal third and brown on apical two thirds, almost twice as long as wide, with scattered setae. Frons yellowish, clypeus light brown, covered with short setae; labella and palpus light brown; first and second palpomeres almost of same length; third to fifth increasingly longer, last one almost twice the length of penultimate. **Thorax**. Scutum light brown, with three large longitudinal bands brown. Scutellum light brown. Pleural sclerites light brown. Pleural membrane yellowish. Scutum moderately arched, covered with scattered small setae. Scutellum with many setulae and six longer setae. Pronotum setose, with some stronger setae. Anepisternum and katepisternum almost straight ventrally, bare. Mesepimeron reaching ventral margin of thorax, bare. Laterotergite slightly projected outwards, with 9–11 setae of different sizes, suture at contact with mediotergite incomplete dorsally. Mediotergite slightly curved in profile, ventral half with two longer setae laterally and smaller ones mesally. Haltere with whitish yellow pedicel and light brown knob, some few setae on pedicel, knob more densely setose. Coxae I and III whitish yellow, coxa II whitish yellow with basal half light brown, femora, tibiae and tarsi whitish yellow. First tarsomere more than twice the length of second one; tibiae and tarsi with erect darker short bristles ventrally along almost entire length, those on hind tibia more or less aligned dorsally and laterally. Tibial spurs 1:2:2, about twice the length of tibial width at apex, internal spurs few shorter. **Wing** (Fig. 4, female wing). Length 3.5 mm, width 1.5 mm. Membrane homogenously hyaline, except light brown maculation on sc-r, on first section of Rs, R_4 and r-m, on section of CuA (beyond insertion of M_4), and a light brown sinuous vertical band at beginning of apical third of wing, running from apex R_1 apex to apex of M_4; membrane densely covered with microtrichia on all cells, macrotrichia widely distributed, more sparsely on basal half, densely on distal half. Sc complete, reaching C beyond base of Rs, with few setae, well sclerotized. C ending before wing apex, extending for just a short distance beyond R_5. First sector of Rs almost perfectly transverse, devoid of setae, less than half length of r-m. R_1 relatively long, reaching C on apical fourth of wing; R_4 present; R_5



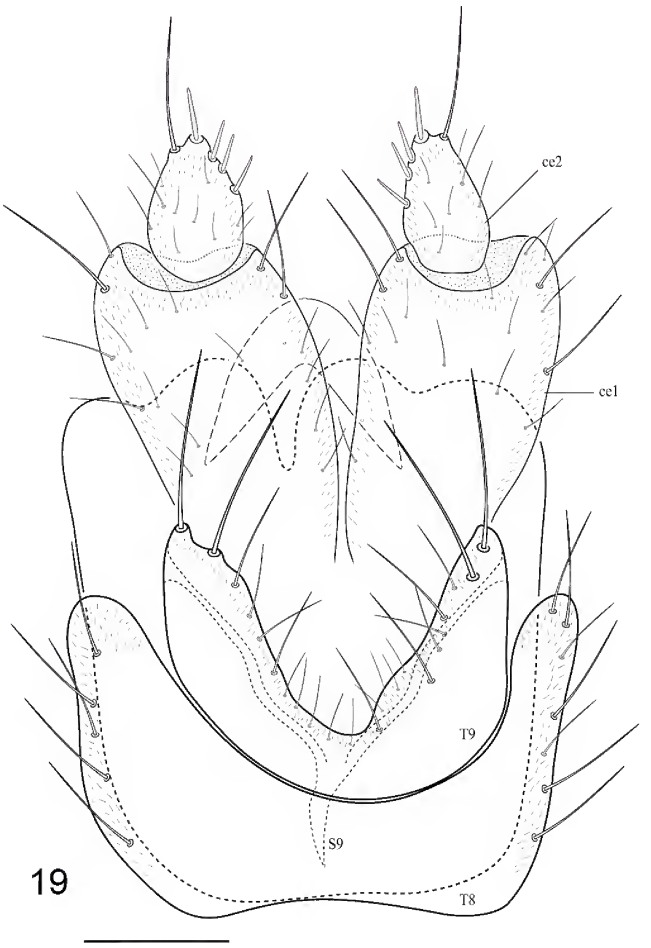


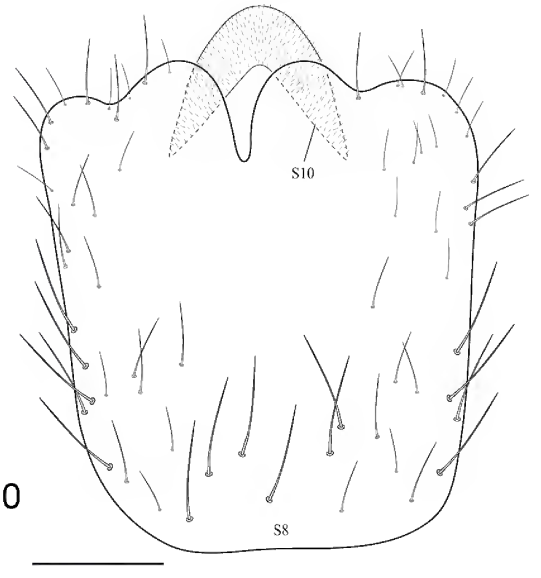


Figures 14–18. Male terminalia of *Stenophragma collessi* n.sp. holotype. *(14–15)* Terminalia, dorsal view. *(16)* Detail of tergite 9 and cerci in dorsal view (left) and in ventral view (right). *(17)* Gonocoxite, gonocoxal apodeme, aedeagus, and parameres, dorsal view. *(18)* Gonostyle, dorsal view. Scale 0.1 mm.



reaching C before wing apex, well sclerotized; r-m curved anteriorly, more or less oblique posteriorly, well sclerotized, setose. M_{1+2} extremely reduced; M_1 and M_2 running more or less parallel along most of their length; first sector of CuA very long, more than twice length of second section of CuA; M_4 strongly curved basally; M_4 and CuA complete, divergent, well sclerotized. A_1 incomplete, absent on apical third, but well produced basally. All posterior veins with dorsal macrotrichia. **Abdomen**. Abdomen brown, setose, slender. T8 short and wide, S8 slender, longer than wide, rounded apically. Terminalia light brown, conspicuous, rounded. **Terminalia** (Figs. 14–18). Gonocoxites setose, fused to each other ventrally only at basal third. Gonostyle long, with a ventral and a dorsal branches; ventral branch with two long setae (one of them much longer than the other ones), besides some regular setae, and a coniform projection





Figures 19–20. Female terminalia of *Stenophragma collessi* n.sp. paratype. *(19)* Terminalia, dorsal view. *(20)* Detail of sternites 8 and 10, ventral view. Scales 0.1 mm.

with nine regular rows of short spines; dorsal branch with three strong spines of different sizes. Aedeagus bifid at apex; parameres membranous, thin at apex; gonocoxal apodeme well developed and sclerotized. T9 long, setose, widening to the apex, rounded at anterior margin, inner surface with a concentration of thin, long setae apically. Cerci weakly sclerotized, covered with many setulae.

Female. As male, except for the following features. Wing length, 4.0 mm, width, 1.6 mm. **Wing** (Fig. 4). Abdomen brown, with some yellowish spots mesally and posteriorly on tergites and sternites. **Terminalia** (Figs. 19–20). Terminalia yellowish. Sternite 8 elongated, with a pair of gonapophyses each with a shallow distal incision, divided by a mesal deeper incision, covered with microtrichia and fine, elongated setae; S9 (genital fork) wide, with a short anterior arm; S10 membranous, rounded at apex, with microtrichia; T8 wide, short mesally, longer than T9, covered with setae; T9 wide, short mesally, covered with setae; T10 not visible; ce1 more than twice ce2 length, covered with microtrichia and scattered setae; ce2 ovoid, covered with microtrichia, few setulae, and three not strongly sclerotized spines.

Etymology. The species name is masculine, named after the great Australian dipterist, Donald H. Colless (24 August 1922–16 Feb 2012), of the CSIRO Division of Entomology's Australian National Insect Collection (ANIC), who has given an outstanding contribution to the understanding of the diversity of different groups of flies in Australasian region.

Comments. *Stenophragma collessi* n.sp. and *S. picticornis*, both from southern Western Australia, have in common a gonostyle with two well characterized branches, bearing strong spines. Nevertheless, the differences in the wing and male terminalia features are more than enough to consider them separate species.

Discussion

As noted by Edwards (1934), one of the most striking differences between the Australian and Neotropical species of *Stenophragma* concerns the shape of the cubital fork. In the Australian species M_4 connecting CuA pretty close to the wing margin, while in the Neotropical species the cubital fork is long, with M_4 sometimes connecting almost at the level of the medial fork, with the exception of *S. ochraceae*, *S. humeralis*, and *S. intermedia*. These species have shorter cubital fork, but not as short as in the Australian species. *Leptomorphus* and other sciophiline genera with plesiomorphic wings have considerably long cubital fork, so the condition shared by the Australian species of *Stenophragma* could be a putative synapomorphy.

The presence of R_4 is widespread in the Neotropical species of *Stenophragma*, although Duret (1976) noticed intraspecific variation concerning the presence of R_4 between wings of the same specimens of *S. longifurcata*. This feature also shows intrageneric variation in other genera of Sciophilinae, as in *Leptomorphus*. In the Australian fauna of the genus, both *Stenophragma bickeli* n.sp. and *S. paponorum* share the absence of R_4.

Key for the Australian species of *Stenophragma*

A key for the Patagonian species of the genus has been provided by Duret (1976), but no key is available for the Australian species of *Stenophragma*, which is furnished here.

1 R_4 absent (Fig. 3) 2

—— R_4 present (Fig. 4) 3

2(1) Maculae not completely crossing the wing, a reduced, light brown macula over first section of Rs and over second sector of CuA (Fig. 3); cercomere 1 of female terminalia slender, twice the length of cercomere 2 (Figs. 12–13) ..... *S. bickeli* n.sp.

—— Three clearly evident maculae crossing the wing, in addition to the spot over first section of Rs (Matile, 1991: fig. 12); cercomere 1 of female terminalia wide, less than twice the length of cercomere 2 (Matile, 1991: fig. 13) ..... *S. paponorum* Matile

3(1) Gonostyle dorsal arm bearing rows of short spines (Fig. 18) 4

—— Gonostyle dorsal arm bearing isolated strong spines, but not rows of short spines (Fig. 9) 5

4(3) M_4 and CuA strongly sinuous (Skuse, 1890: plate XIX, fig. 5) ..... *S. picticornis* Skuse

—— M_4 and CuA not sinuous (Fig. 4) ..... *S. collessi* n.sp.

5(3) Brown band across the wing originating at apex of R_1 only slightly curved, wide ..... *S. hirtipennis* Skuse

—— Brown band across the wing originating at apex of R_1 more or less sinuous, slender (Skuse, 1888: plate 31, fig. 9) ..... *S. meridianum* (Skuse)

The maculation on the wing membrane varies considerably within *Stenophragma* and is a helpful feature to identify many of the species of the genus. Most Neotropical species of *Stenophragma* have hyaline wings, even though *S. andina*, *S. longifurcata*, and *S. argentina* have patterned wing. All Australian species of *Stenophragma* have some degree of maculation on the wing membrane as well. A detailed study of the wing patterns also could provide useful characters for the phylogeny within the genus *Stenophragma*.

It is worth commenting that differences related to the shape of female S8 and the cerci are enough to allow species recognition, although scarce attention has been given to female terminalia morphology in the literature. With respect to the male terminalia, there is an amazing variation of the shape of the gonostyle, and T9 also shows considerable differences between the species. *S. collessi* n.sp. and *S. picticornis*, both from southern Western Australia, share a gonostyle with two branches, one of which has a sequence of rows of short spines (also seen, in different shapes, in Neotropical species). *S. bickeli* n.sp., on the other hand, known from northern Western Australia, has a gonostyle with three branches, while *S. meridianum* and *S. hirtipennis* have much simpler gonostyli. *S. paponorum* is known only from females.

Ladiges *et al.* (2011) have shown that a clade of eucalypt species from the northern and central Deserts plus the Pilbara region is closely related to a clade of species from the southern Desert plus southwestern areas. The type-locality of *Stenophragma bickeli* n.sp. is in the Pilbara region, while the type-localities of *S. collessi* n.sp. and *S. picticornis* correspond to southwestern Australia. A study of the phylogenetic relationships, and, hence, a biogeographical study of the Australian species of *Stenophragma* is outside the scope of this paper. However it is interesting that the distribution of some of the species of *Stenophragma* mirrors that known for *Eucalyptus*, indicating that the biogeographical history of the mycetophilids might fit in a general pattern known for the region.

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